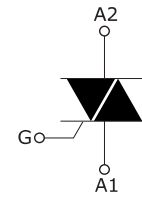


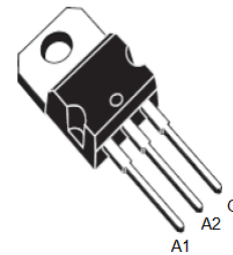
**Product features and main applications:**

NPNP five-layer structure of silicon bidirectional devices; with independent intellectual property rights of single-sided digging technology, table glass passivation process; multi-layer metallized electrodes on the back; with high blocking voltage and high temperature stability.



**Mainly used in:**

vacuum cleaners, power tools and other motor speed controllers; solid state relays; heating controllers (temperature regulation); other phase control circuits.



TO-220A

**Characteristics**

**Table 1. Absolute maximum ratings (Tj = 25 °C unless otherwise stated)**

Symbol	Parameter name		value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)	BTA Tc=80°C	24	A
$I_{TSM}$	Non repetitive surge peak on-state current (full cycle, Tj initial = 25 °C)	F=50HZ tp=20ms	240	A
$I^2t$	I <sup>2</sup> t value for fusing	tp=10ms	288	A <sup>2</sup> S
di/dt	Critical rate of rise of on-state current IG = 2 x IGT, tr ≤ 100 ns	Tj=125°C	50	A/us

$V_{DRM}/V_{RRM}$	Off state repetitive peak voltage Reverse repetitive peak voltage	$T_j=25^{\circ}\text{C}$		800	V
$I_{GM}$	Peak gate current	$t_p=20\mu\text{s}$	$T_j=150^{\circ}\text{C}$	4	A
$P_{G(AV)}$	Average gate power dissipation		$T_j=150^{\circ}\text{C}$	1	W
$T_{stg}$ $T_j$	Storage junction temperature range Operating junction temperature range			-40 to +150 -40 to +125	$^{\circ}\text{C}$

**Table 2. Electrical characteristics ( $T_j = 25^{\circ}\text{C}$ , unless otherwise specified)  
--3quadrants**

Symbol	Name and test conditions	Quadrant	Range	value	Unit	
$I_{GT}$	$V_D=12\text{V}$ $R_L=100\Omega$	I II III	MAX	$\leq 50$	mA	
$V_{GT}$			MAX	1.5	V	
$V_{GD}$	$V_D = V_{DRM}$ , $R_L = 3.3\text{ k}\Omega$ , $T_j = 125^{\circ}\text{C}$		MIN	0.2	V	
$I_H$	$I_T = 100\text{ mA}$		MAX	80	mA	
$I_L$	$I_G = 1.2 \times I_{GT}$		MAX	I -III	80	mA
				II	100	
$dv/dt$	$V_D = 67\% V_{DRM}$ , gate open, $T_j = 125^{\circ}\text{C}$		MIN	500	V/us	
$(dv/dt)_c$	Critical rise rate of commutation voltage $T_J = 150^{\circ}\text{C}$		MIN	10	V/us	

**Table 3. Electrical characteristics (T<sub>j</sub> = 25 °C, unless otherwise specified) -Standard Triac (4 quadrants)**

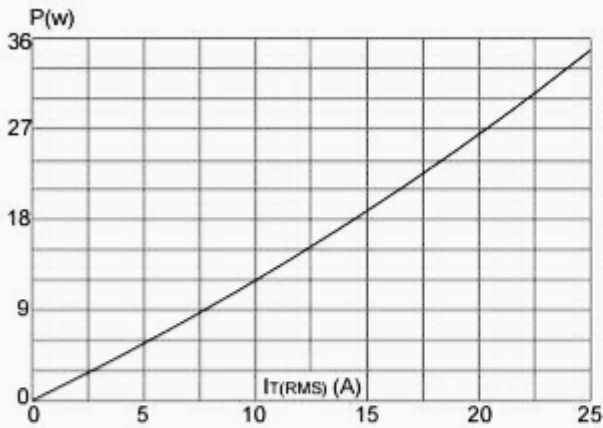
Symbol	Name and test conditions	Quadrant	Range	value		Unit
I <sub>GT</sub>	V <sub>D</sub> =12V R <sub>L</sub> =100Ω	I II III IV	MAX	I II III	IV	mA
				≅ 50	≅ 120	
V <sub>GT</sub>	MAX		1.5		V	
V <sub>GD</sub>	VD = VDRM, RL = 3.3 kΩ, T <sub>j</sub> = 125 ° C		MIN	0.2		V
I <sub>H</sub>	I <sub>T</sub> =500mA		MAX	80		mA
I <sub>L</sub>	IG = 1.2 x IGT		MAX	80		mA
				100		
dv/dt	VD = 67% VDRM, gate open, T <sub>j</sub> = 125 ° C		MIN	500		V/us
(dv/dt) <sub>c</sub>	Critical rise rate of commutation voltage T <sub>J</sub> = 150 ° C		MIN	10		V/us

### Static parameters

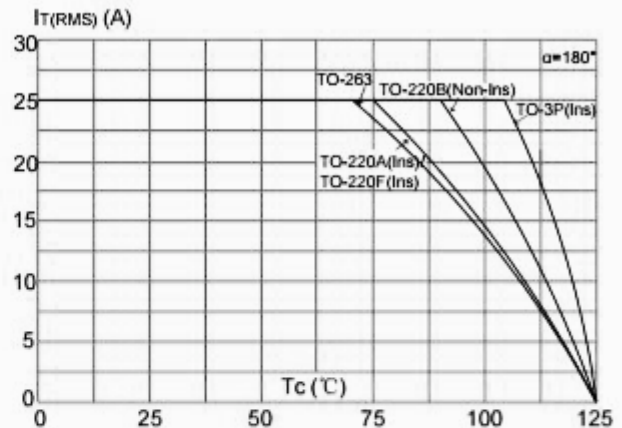
Symbol	Parameter name			value	Unit
V <sub>TM</sub>	I <sub>TM</sub> = 50A	T <sub>j</sub> =25°C	MAX	1.55	V
V <sub>T0</sub>	threshold on-state voltage	T <sub>j</sub> =150°C	MAX	0.87	V
R <sub>d</sub>	Dynamic resistance	T <sub>j</sub> =150°C	MAX	14.6	mΩ
I <sub>DRM</sub> I <sub>RRM</sub>	VDRM = VRRM	T <sub>j</sub> =25°C T <sub>j</sub> =150°C	MAX	5	uA
				1	mA
R <sub>th(j-c)</sub>	Junction to ambient	BTA	MAX	2.05	°C/W

**BTA24 characteristic curve**

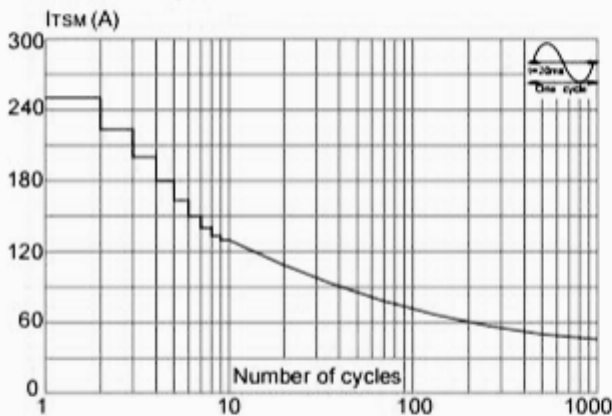
**FIG.1:** Maximum power dissipation versus RMS on-state current



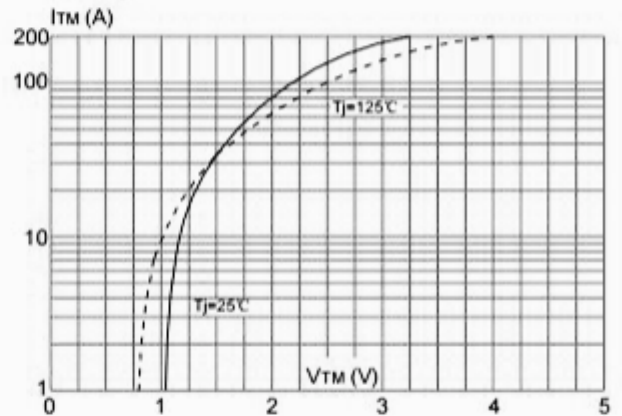
**FIG.2:** RMS on-state current versus case temperature



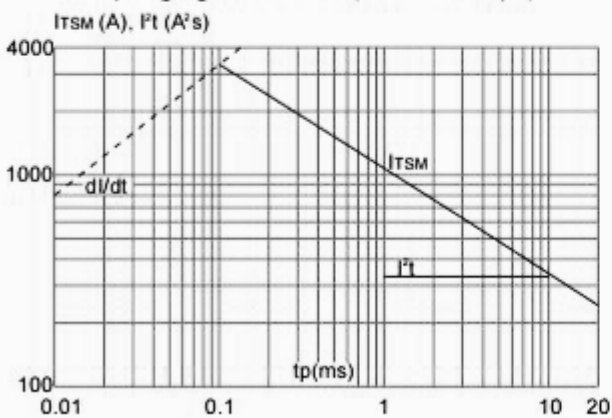
**FIG.3:** Surge peak on-state current versus number of cycles



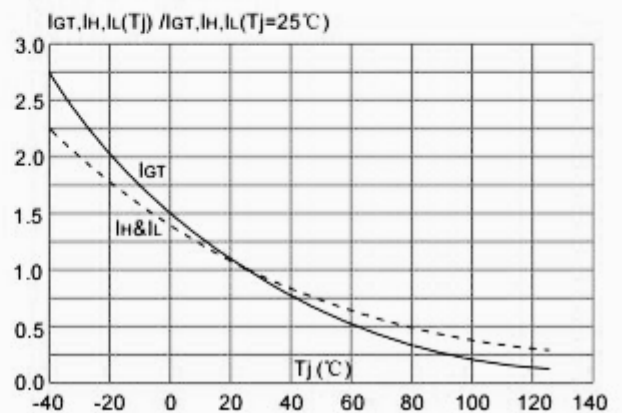
**FIG.4:** On-state characteristics (maximum values)



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 50\text{A}/\mu\text{s}$ )

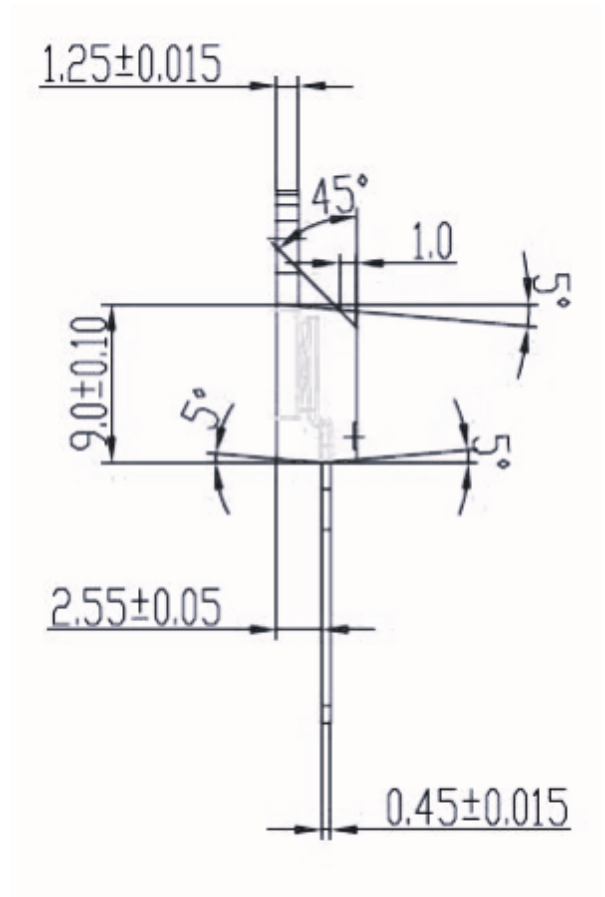
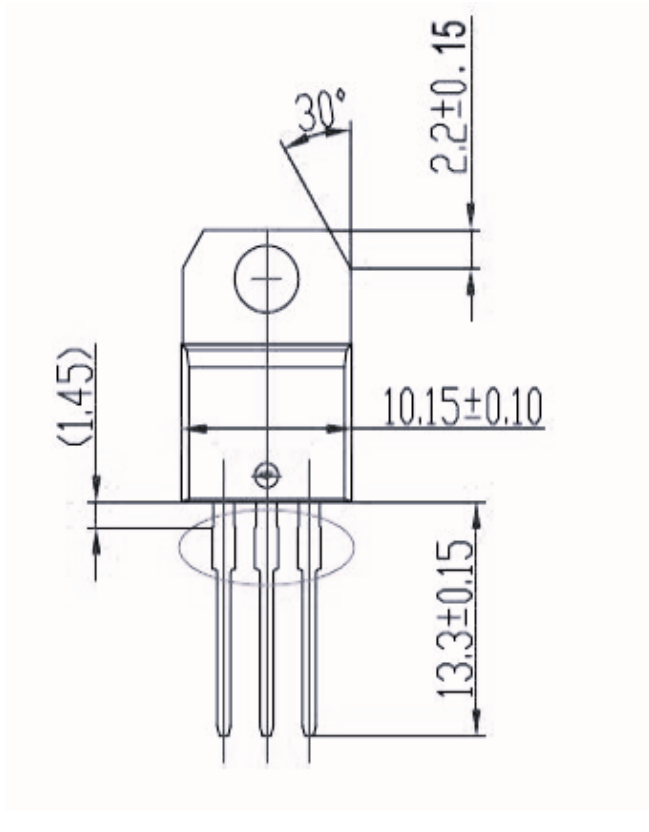


**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



**TO-220A Dimensional drawing:**

Unit: mm ( $\pm 0.1$ )



### Ordering information

Order code	Package	Baseqty	Deliverymode
UMW BTA24-600CRG	TO-220A	1000	Tube and box
UMW BTA24-600BWRG	TO-220A	1000	Tube and box
UMW BTA24-600CWRG	TO-220A	1000	Tube and box
UMW BTA24-800CRG	TO-220A	1000	Tube and box
UMW BTA24-800BRG	TO-220A	1000	Tube and box
UMW BTA24-800BWRG	TO-220A	1000	Tube and box
UMW BTA24-800CWRG	TO-220A	1000	Tube and box